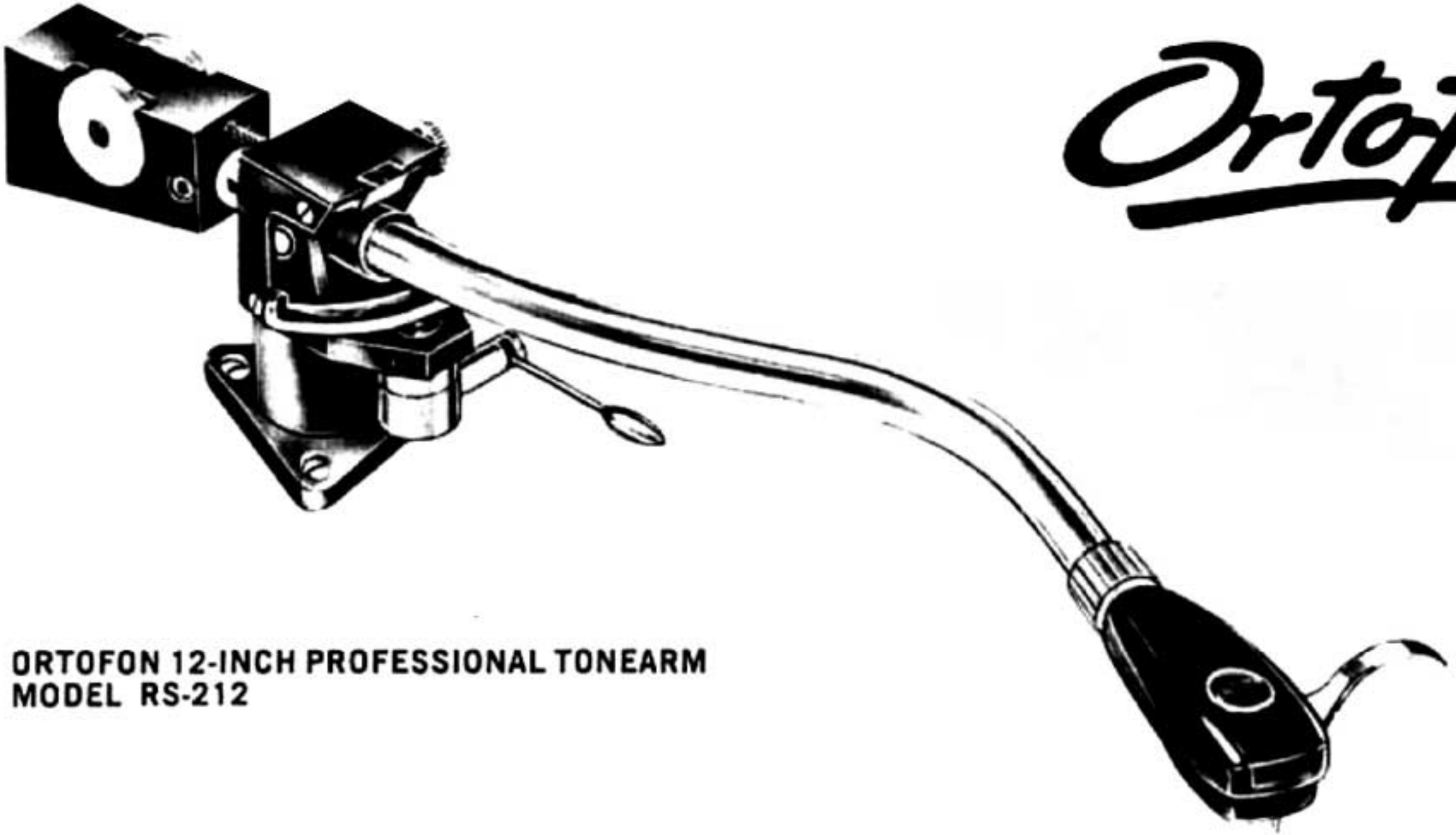


Ortofon

ORTOFON 12-INCH PROFESSIONAL TONEARM
MODEL RS-212

TECHNICAL DATA

Dimensions

Total length	300 mm (11.8")
Distance between center of arm base and center of turntable	212 mm (8.37")
Range of adjustable height (center of arm tube to mounting plate)	35-60 mm (1⅜"-2⅜")
Diameter of arm base	50 mm (2")

Specifications

Effective length (center of arm base to stylus tip)	228 mm (9")
Off-set angle	22.7°
Maximum tracking error distortion	1.19%
Optimum overhang	16 mm (⅝")
Adjustable stylus pressure	0-4.5 grams

Weights

Cartridge	7-19 grams
Pickup arm	425 grams

CONTENTS OF HARDWARE PACKAGE

For Installing Tonearm

- 3 ¾" machine screws
- 3 Washers
- 3 Hex nuts
- 3 7/16" wood screws

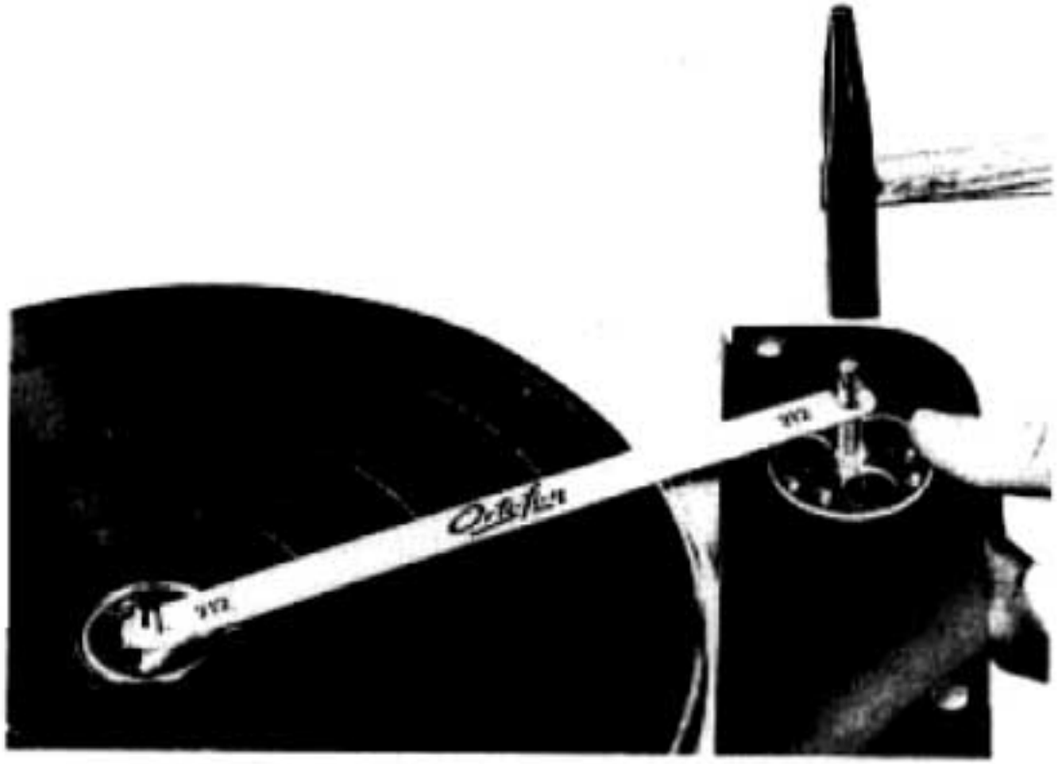
For Mounting Cartridge In Plug-In-Shell

- 1 5/32" machine screw
- 2 ¼" machine screws
- 2 ½" machine screws
- 2 ⅝" machine screws
- 1 3/32" flat head machine screw
- 2 3/32" spacers
- 2 5/32" spacers
- 2 ¼" spacers
- 2 9/32" spacers
- 1 Lead weight
- 1 Large, square, slotted mounting plate
- 1 Small, rectangular mounting plate
- 1 Mounting stirrup

TONEARM INSTALLATION

NOTE: If you have purchased model RS 212/T (pre-mounted) for installation on the THORENS TD 124, TD 121, TD 125, TD 150, you may proceed to Step 8. Remove the three screws securing the black (undrilled) arm board from the turntable and install the pre-mounted arm board supplied with your ORTOFON RS 212/T tonearm. For the TD 150, four (4) screws are located on the underside of the chassis.

1. Place one end of the metal template on the turntable spindle and insert the plastic gauge at the other end. Locate the plastic gauge along the arc to the most convenient position that minimizes plug-in-shell and counterweight overhang in relation to the tonearm mounting board. If a dust cover is to be used, or the turntable is to be installed in an enclosure, position the tonearm along the arc to fit within the area of the dust cover or enclosure. Before marking the template position, check the underside of the arm board to make certain the position of the holes to be drilled are not over the turntable chassis members.



2. After the desired position has been located, mark the position of the center hole and place the center of the plastic template for the arm post directly over the mark, as determined in Step 1 above. Mark the position of the base mounting screws as designated on the plastic template. Drill those base mounting holes marked No. 1 for Model RS 212.

3. Drill a 7/8" diameter hole (may be up to 1" if 7/8" bit is not available) at center hole mark.
4. The hardware used in mounting the tonearm base is as follows:
   - 3 ¾" machine screws
   - 3 Washers
   - 3 Hex nuts

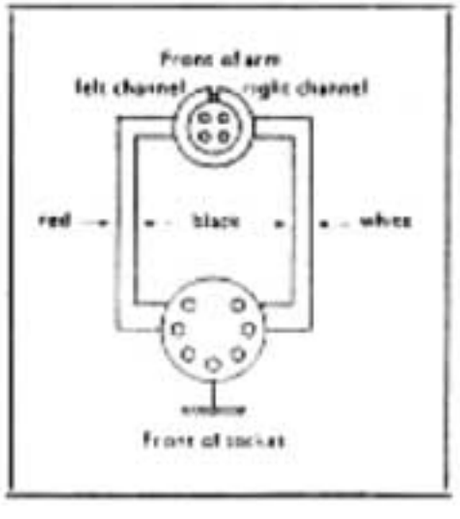
   OR

   - 3 7/16" wood screws

5. Remove the tonearm base from the tonearm by loosening the set screw, using the small hex wrench.
6. At this point you have an option. If your tonearm is to be mounted on wood, you may choose to utilize the three (3) wood screws. If so, position the arm base on the arm board and locate the set screw, in the base, to the right for easy access and secure the base to the arm board. If use of the machine screws is preferred, drill three (3) holes ⅛" diameter in the marked positions. Secure the base to the arm board using the washers and hex nuts and locating the set screw in the arm base to the right.
7. Locate the most convenient position for the tonearm rest. Drill a ½" diameter hole and secure the arm rest base with washer and hex nut.
8. Insert the pickup head into the tonearm and the arm into the base and adjust to parallel the tonearm tube to the top of the turntable with a record on it. Tighten the set screw in the arm base to secure the tonearm. Make certain the laterial swing of the tonearm covers the record area. Loosen the set screw in the base and readjust if necessary.

9. Install the arm rest so the height of the arm rest corresponds to the height of the tonearm when lifted by the cueing device.

10. Your ORTOFON tonearm is supplied with a four (4) foot, shielded, twisted pair of audio cables with connector plugs for the pre-amplifier and a seven (7) pin connector for the base of the tonearm. Included with the audio cable is a separate "fifth wire" ground to facilitate separate grounding of the tonearm.



Your ORTOFON tonearm is now ready for installation of the cartridge. If you have purchased the OROTOFON SPU/GT, SPE/GT or S15/MT, factory mounted cartridge, merely insert the cartridge into the tonearm, locking the screw collar securing the cartridge to the tonearm. Vertical and lateral balance is achieved automatically since the factory mounted ORTOFON cartridges are specially designed to weigh exactly 31 grams (the required weight for zero balance).

NOTE: You may now proceed to Section 5.

NOTE: Your ORTOFON cartridge employs a strong magnet. If your turntable is equipped with a ferrous (steel) platter, check the zero balance setting off to the right side, beyond the influence of magnetic pull. The tonearm should remain perfectly parallel at the zero setting of the stylus force knob.

SECTION 2

CARTRIDGE MOUNTING INSTRUCTIONS

Your ORTOFON RS series tonearm is factory adjusted for a perfect lateral and vartical balance at exactly 31 grams, with the removable counterweight insert in place and the anti-skating force setting at zero. Refer to Section 4 for other balance ratios. Therefore, the plug-in-shell, cartridge and combination of hardware necessary to install the cartridge must weigh 31 grams. The following procedure outlines the various steps to achieve the correct plug-in-shell weight. Once your cartridge is installed, you may interchange other cartridges without rebalancing or readjusting the counterweight, provided they are carefully installed to achieve the 31 grams required for zero balance.

ORTOFON S 15/T

Use the small rectangular mounting plate and the 3/32" flat head machine screw. Place the plate in the slotted section so that the fixing holes are near the front of the shell and secure with the screw. Use the two (2) ⅝" machine screws to secure the cartridge and connect the wires observing the color code and cartridge markings.

ORTOFON SPU/T and SPE/T

Use the mounting stirrup and a 5/32" machine screw. Place the stirrup in the slotted section and secure with screw. Use the two (2) ¼" machine screws in the cartridge mounting holes nearest the stylus (forward pair) and secure to the stirrup. Connect the wires observing the color code and cartridge markings.

Color Code

Right Channel	Red Lead—"Hot"
	Black Lead—"Ground"
Left Channel	White Lead—"Hot"
	Black Lead—"Ground"

By placing the cartridge shell bottom up and with the plug-in portion to your right, the two "bottom"

terminals in the shell are the "hot" ones and the two nearest the "top" are "ground". The pin furthest away is the "left channel" and the pin nearest you is the "right channel". The arm ground is internal, therefore, it is not necessary to have a "fifth lead" to the cartridge. Attach the leads as specified by the cartridge manufacturer.

SECTION 3

OTHER CARTRIDGES

1. With the shell upside down, place the brass slide in the shell (loosely) and hold cartridge in place (do not fasten the leads). (Line up the mounting holes, of the cartridge, to position the stylus ⅛" behind the leading edge of the plug-in-shell). The placement of the holes, in the brass cartridge slide plate, can be either to the front or to the rear depending on the location of the cartridge mounting holes. Select the proper spacers, or studs, so that the stylus protrudes below the edge of the shell, remove the cartridge and leave the plate in, noting alignment, and mark the inside of the shell for realignment when a final installation is to be made.
2. Insert the 3/16" screw into the mounting plate slot in the forward plug-in-shell hole — DO NOT TIGHTEN!
3. Select the proper length screws and install the cartridge onto the brass plate — DO NOT TIGHTEN!
4. Secure the shell into the tonearm by inserting the pin into the slot and tightening the knurled ring in a counter-clockwise direction (when facing arm). Set calibrated scale and anti-skating knobs at "0". If the tonearm is perfectly horizontal, your tonearm is balanced.

Caution:

Do not allow the stylus to hit the chassis.

Note: If the plug-in-shell is above level, zero balance may be achieved two (2) ways.

A. The tonearm may be recalibrated (refer to Section 4) and then steps 6 through 9 below should be followed:

B. The plug-in-shell may be weighted. To weight the plug-in-shell proceed to steps 5 through 9 below.

5. Place the lead weight on top of the plug-in-shell. Sections of the soft lead weight may be broken off, if necessary, to obtain a balance for the plug-in-shell, cartridge and hardware used. Do not break off too much of the lead weight. Trim only as much as required to achieve balance. Remove the cartridge and brass slide and insert the lead weight into the shell, pressing to fit the contour of the inside of the shell. This should be a force fit and the lead weight should be rigid.

6. Replace the brass slide in the previously marked position and secure with a 3/16" screw (CAUTION — Do Not Strip Thread In The Shell).

7. Check the stylus overhang by placing the cartridge directly over the turntable spindle. The stylus should extend ⅜" to the left of the spindle. Move the brass slide forward, or back, in the plug-in-shell to obtain the correct setting. If adjustment cannot be achieved, reverse the brass slide so the threaded holes for the mounting screws provide further range for adjustment.

8. Before making the final installation of the cartridge it is easier to attach the wire leads in the shell to the cartridge pins. Observe the wire color coding and cartridge markings (refer to Section 2 for color code).

9. Reinstall the cartridge and tighten all screws. The color code of the audio cable is:

   Right Channel—Red Plug

   Left Channel—Green Plug

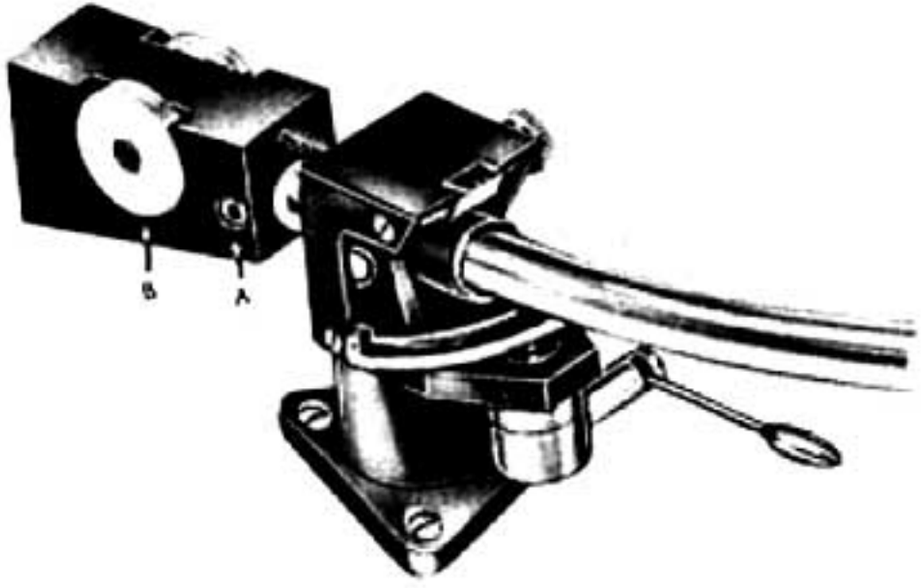
SECTION 4

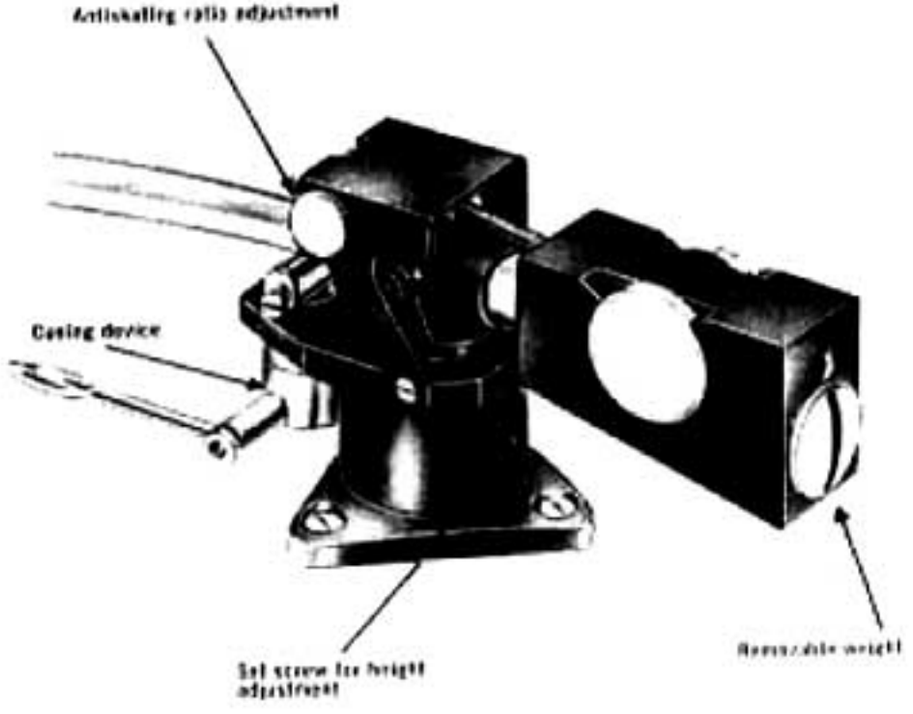
RECALIBRATING YOUR RS TONEARM

The range of counterbalance adjustments, with the removable counterweight insert in place, is from 32 to 23 grams. With the removable counterweight insert removed, the range of counterbalance adjustments is from 23 to 14 grams. The RS series tonearm may be rebalanced and calibrated to zero balance with any cartridge weight within these ranges.

Should a combined plug-in-shell, cartridge and hardware weight of 27 grams be chosen for zero balance, with the counterweight insert in place, the corresponding zero balance, without the counter-weight insert, would be 18 grams. Refer to the chart for other ratios.

32	31	30	29	28	27	26	25	24	23	with insert
23	22	21	20	19	18	17	16	15	14	without insert





Once a new zero balance setting is chosen from the ratio chart, the entire counterweight assembly must be moved to rebalance the tonearm. Use the large hex wrench to loosen the set screw in the side of the counterweight (A) (do not remove the screw). Also loosen the set screw in the center of the stylus force knob (B), with the small hex wrench (do not remove the screw). Dial the anti-skating force setting to zero. Slide the counterweight forward or back until the tonearm balances horizontally. Move the stylus force knob on the right (without the scale markings) until the gimbal spring is relaxed, neither pulled nor compressed, and recheck the zero balance of the counterweight and observe the action of the gimbal spring until the latter has no effect upon the zero balance. Lock the position of the counterweight in place with the set screw. Rotate the left stylus force knob (with the stylus force markings) until the zero (0) mark lines up with the front edge of the opening. Tighten the set screw in the center of the stylus force knob. Check the stylus force setting with a stylus pressure gauge at 1, 2 and 3 grams for accuracy. Repeat the above steps, in the described order, if necessary, until calibration accuracy is achieved.

SECTION 5

STYLUS FORCE ADJUSTMENTS

The stylus pressure is applied by dialing the knob on the counterweight. Each calibration marking indicates ½ gram.

The anti-skating force is automatically applied in proportion to the stylus pressure.

ANTI-SKATING ADJUSTMENTS

The anti-skating force adjustment is independent of the tracking force adjustment and will have no effect upon the latter. The tracking force adjustment, however, will automatically increase the anti-skating force in direct proportion to the tracking force (stylus pressure) applied. Therefore, constant readjustment of the anti-skating force is not necessary.

The anti-skating force is obtained by a sideways displacement of the stylus force spring in relation to the lateral pivot. The stylus force spring, therefore, provides an automatic relation of anti-skating force to stylus force with each adjustment of the stylus force knob. The geometry of the tonearm design is such that the anti-skating force changes as the radius of the record decreases proportionally with the changing skating force.

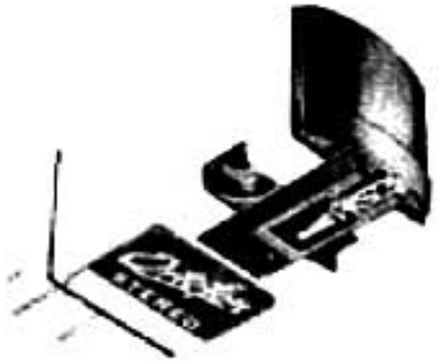
Ortofon

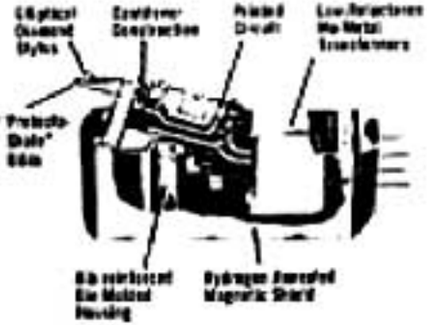
STEREO CARTRIDGES

WORLD RENOWNED ORTOFON S-15T STEREO CARTRIDGE

For any transcription turntable, there is one superb cartridge – the S-15T. This is Ortofon's definitive cartridge that mates with the finest precision tonearms to give magnificent performance. The matching high impedance transformer has been built right into the cartridge casing.

The S-15T is a rugged, super-sensitive cartridge that has achieved a new milestone in **sound REcreation.** Acclaimed by leading sound engineers as "the finest cartridge ever available for home use" . . . Made to last a lifetime. The elliptical shape of the stylus conforms closely to that of the original record cutting head. 15° tracking angle matches precisely the angle used to manufacture most new records. Virtually eliminates pinch effect, inner groove distortion and bottoming distortion. Made exclusively with prime polished diamonds. Features printed circuits, ultra-high, sensitive compliance, and exclusive record care "Protecto-Skate" glide. Frequency response 15 to 40,000 Hz: impedance 15,000 ohms. Recommended stylus pressure: 1 to 2 grams. Channel separation: 20 to 30 db.





ORTOFON S-15MT STEREO CARTRIDGE (MOUNTED)

The Ortofon S-15MT is the cartridge above, factory mounted in a shell that fits all Ortofon and SME tonearms. The user need have no qualms about the accuracy of his mounting: the S-15MT is the S-15T precision aligned by Ortofon in a shell to track and reproduce perfectly. The four stereo connections are made at the factory. Instead of the usual wires, Ortofon has designed silver-plated coil spring connections from the cartridge to the terminals that connect into the tonearm. The use of coil springs guards against any undesirable resonance, and also insures perfect contact.

ORTOFON SL-15 STEREO CARTRIDGE

Designed to meet the full capabilities of the finest transcription turntables, the SL-15 was specifically engineered to fit the tonearms of the excellent automatics on the market. Thus, it is the best all-round cartridge obtainable. An Ortofon breakthrough, the SL-15 meets the highest specifications for a cartridge and will bring out the full capabilities of any turntable — manual or automatic.

The SL-15 is ultra lightweight and compact to assure minimum record-wear tracking. It uses a polished elliptical shaped diamond stylus made from select prime diamonds. Stylus arm housed in a stationary metal tube (same as in famed S-15T transcription model). Unique "Protecto-Skate" glide guards stylus against damage from undue sideward motion or downward pressure. Recommended stylus pressure: ¾ to 1½ grams. Channel separation: 20-30 db. Frequency response: 10 to 40,000 Hz. Weight of pickup cartridge: 7 grams. The vertical tracking angle is an exact 15° when tracking at 1½ grams tracking force. Output impedance: 2 ohms. Equivalent mass at stylus point: 0.9 mg. (the smallest of any cartridge manufactured today). For systems where a high impedance is required, the SL-15T with transformer is available. (See description of 2-15K Transformer below.)

With the superlative performance possible from today's amplifiers and recordings, there must be cartridges and tonearms capable of bringing out this full potential. Ortofon manufactures such a line of cartridges and tonearms.

The SL-15 is a no-compromise stereo cartridge, manufactured with Ortofon's exacting performance standards for fine turntables, manual and automatic. Because of its size and weight, it is ideal for use in the tonearms of the best automatics.

ORTOFON SL-15T
(STEREO CARTRIDGE WITH TRANSFORMER)

The majority of amplifiers (or receivers) today, require a cartridge with a high impedance input. For this use, the SL-15 has been designed to accommodate an Ortofon transformer (the Model 2-15K). Packaged with this transformer and a complete cable assembly, it is designated the SL-15T. In the SL-15T, the user has the flawless cartridge described above, together with the high impedance matching transformer described below, and can expect his system to bring out the complete brilliance of the finest recordings manufactured. The output impedance of the SL-15T is 15,000 ohms.

ORTOFON 2-15K PLUG-IN TRANSFORMER

Due to the low impedance and output voltages of some cartridges – such as the SL-15 – it is often necessary to employ a transformer. Ortofon offers a twin-transformer (for stereo use) with cables and plugs which can be plugged in between the normal connecting cables and standard amplifier input (47000 ohms). The output impedance of the transformer is 15000 ohms. However, this does not mean that the amplifier input impedance has to be 15 k ohms, too. The electrodynamic system has a "flat" (velocity verus frequency) response irrespective of the load. The specifications of this transformer are: input impedance: 2 ohms. Output impedance: 15000 ohms. Load impedance: 47 K ohms. Frequency response: 10 to 40,000 Hz.